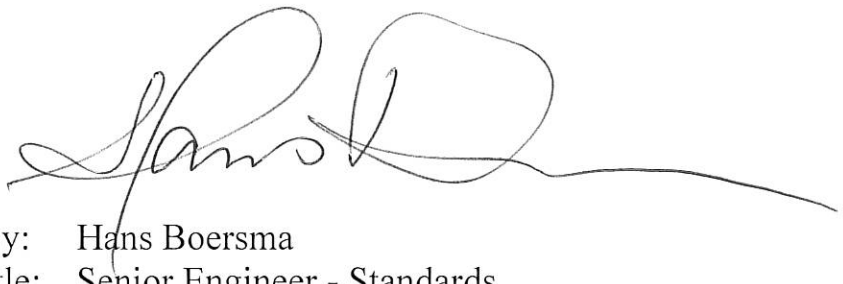
OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

BOARD STAFF'S REVIEW OF THE PETITION

By: Mr. Andras Uhlyarik, President, California Pulse, Inc.

Petition File No.: 528



Submitted By: Hans Boersma
Title: Senior Engineer - Standards
Date: May 24, 2012

INTRODUCTION

On February 14, 2012, the Occupational Safety and Health Standards Board (Board) received a petition via email from Mr. Andras Uhlyarik (Petitioner), President of California Pulse, Inc., in Apple Valley, California.

The Petitioner requests that the Board amend Title 8, California Code of Regulations (CCR) by adopting Section 7.5 of the National Fire Protection Association (NFPA) 33, 2011 edition. The referenced Section 7.5 of the NFPA 33-2011 contains standards for the recirculation of exhaust air from spray areas using Flammable or Combustible Materials.

Labor Code Section 142.2 permits interested persons to propose new or revised regulations concerning occupational safety and health and requires the Board to consider such proposals and to render its decision no later than six months following receipt of such a proposal. In accordance with Board policy, the purpose of this evaluation is to provide the Board with relevant information upon which to base a reasonable decision.

REASON FOR THE PETITION

The Petitioner feels that the changes in the spray finishing industry addressed in the 2011 edition of the NFPA 33, Section 7.5 should be reflected in the Title 8, CCR to clarify the acceptable method for recirculation of exhaust air from spray areas.

HISTORY

The Board's petition log indicates that the Board has not granted or denied any other previous petition to update Title 8 standards in accordance with the latest edition of NFPA 33 Standard for Spray Application Using Flammable or Combustible Materials. On February 16, 2012, the Board denied a petition request from the Petitioner to update Title 8, CCR, General Industry Safety Orders (GISO), to be consistent with the 2011 edition of the National Fire Protection Association 33. The Petitioner request would have resulted in amending more than two dozen CCR sections within three articles.

On October 18, 2007 the Board granted Fleetwood Motor Homes of California, Inc. a permanent variance from GISO Section 5153(c)(1). Section 5153 contains ventilation and personal protective equipment requirements for spray coating operations and prohibits the recirculation of spray booth air. The Fleetwood variance concerned the recirculation of air in Fleetwood's spray booths at its Riverside, California facilities. Previous to Fleetwood, the Board granted two other variances concerning the recirculation of spray booth air during staffed operations. Board staff recommended granting the variance, subject to conditions; the Division of Occupational Safety and Health (Division) urged denial of the variance. In 1985 the Board granted HessCo Industries Inc. a permanent variance from GISO Section 5153(c)(1). The HessCo variance involved the recirculation of exhaust air for bathroom fixture spray coating operation. Board and Division staff recommended granting the HessCo variance subject to conditions. In 1997 the Board granted Gulfstream Aerospace a permanent variance from Section 5153(c)(1). The Gulfstream variance involved the recirculation of exhaust air for two aircraft painting hangers. Board and Division staff recommended granting the Gulfstream variance subject to conditions.

In late 2002, Board staff formed an advisory committee to consider amendments to California Code of Regulations, Title 8, Section 5153 to permit the recirculation of spray booth exhaust. Several committee meetings were planned, with the first convened on January 29, 2003, to consider the recirculation of spray booth exhaust in unoccupied spray operations. Minutes from the meeting indicate there was consensus among the participants on several issues which included having the proposal address staffed and unstaffed spray booth operations. The second committee meeting was tentatively planned for September 2003, to consider occupied or staffed spray operations, but was never convened and further efforts regarding the issue of the recirculation of spray booth exhaust were postponed.

NATIONAL CONSENSUS STANDARDS

NFPA 33-2011 is the latest edition of this standard. NFPA 33-2011, section 7.5.1 allows recirculation of exhaust air only if a set of strict conditions are met, including the requirement that the recirculation of exhaust air is only allowed for unstaffed spray operations and for cascading to subsequent unstaffed spray operations. Section 7.5.2 states, "The provisions of 7.5.1 shall not disallow recirculation of air to occupied spaces. However, other requirements addressing the toxicity and permissible exposure limits shall also apply. *(See ANSI/AIHA Z9.7, American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems).*"

The ANSI/AIHA Z9.7-2007, American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems, establishes minimum criteria for the design and operation of a recirculating industrial process exhaust ventilation system used for contaminant control. This standard's application includes recirculation of air from spray coating booths.

The ANSI/AIHA Z9.3-2007, American National Standard for Exhaust Systems Spray Finishing Operations- Safety Code for Design, Construction, and Ventilation, establishes minimum safety and health standards to help manufacturers and users protect the health of personnel from injurious effects of contact with gases, vapors, mists, powders, or solvents used in, or created or disseminated by spray finishing operations. This standard permits recirculation of exhaust air under conditions set forth in the NFPA 33 Sections 7.5.1 and 7.5.2.

FEDERAL OSHA STANDARDS

The current federal OSHA spray finishing standard in 29 CFR 1910.107(d)(9) states that "Air exhausted from spray operations shall not be recirculated." Federal OSHA is in the process of revising its standards for general industry that reference national consensus standards, including the NFPA 33 standard to reflect the latest version of consensus standards. Current federal OSHA standards reference the 1969 edition of NFPA 33. However, under the current OSHA policy on de minimis violations, employers are allowed to comply with the most current consensus standards applicable to their operations, rather than with the OSHA standard in effect at the time of inspection, when the employer's action provides equal or greater employee protection.
De minimis violations are violations of existing OSHA standards which have no direct or immediate relationship to safety or health and result in no citation or penalty and do not have to be abated.

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (Division) EVALUATION

In its petition evaluation report, dated April 10, 2012, the Division indicated that it does not recommend granting this petition and feels the Petitioner's request is problematic for several reasons. The Division stated that the proposal lacks the necessary protective measures that would address hazards associated with the increased concentration of contaminants in spray booths during operation where exhaust air is recirculated. For that reason, the Division feels that adopting NFPA 33 section 7.5 as proposed by the Petitioner would make California's spray coating standard in Section 5153 less effective than the Federal standard in 29 CFR 1910.107(d)(9). The Division also feels that the Petitioner's proposal, if adopted, would not provide the necessary guidance for the safe operation of spray coating operations with recirculating exhaust air. Also, the spray coating standards as proposed would not be enforceable, because the employer and the Division would have difficulty identifying acceptable control parameters for every possible type of flammable spray coating used, at any concentration and for any duration.

STAFF ANALYSIS

SPRAY COATING OPERATIONS

Spray-coating operations deposit organic or inorganic materials (in dispersed form) on surfaces to be coated, treated, or cleaned by means of a spray gun and include such diverse activities as the application of flammable and combustible paints and resins in a spray booth or spray area, electrostatic coating operations, automobile body shops and fiber-reinforced polymer/plastics manufacturing. Therefore a wide range of industries would be affected by the amendment proposed by the Petitioner.

In painting operations the primary function of spray guns is to produce microscopic droplets, a mixture of resins and solvents that exit the spray gun nozzle and strike the work-piece. As the droplets land on the surface of the work-piece, they combine to form a liquid film and begin to polymerize as the solvent evaporates. Solvent typically makes up from 30 to 70 percent of the paint volume. Overspray, which is spray that does not land on the work surface remains airborne in a fine liquid particulate form and can account for 10 to 60 percent of the paint that is sprayed.

Spray-coating operations, regulated under Section 5153, take place in a ventilated workroom or spray booth. Functionally, spray booths support the painting process by controlling the spray coating environment to ensure coatings are applied and cured under the proper conditions. Additionally, the spray booths remove the overspray and evaporated solvents through its ventilating air exhaust system. Particulate filters installed in the exhaust system can easily capture overspray, however, the evaporated solvents are a gas that is difficult to capture because it is mixed in with large volumes of ventilation exhaust air. Typical control devices for organic solvents are carbon adsorbers and thermal incinerators; however, these are expensive for treating the full exhaust rate of a typical spray booth in most industrial settings.

When applying the spray coating with the spray gun, much of the overspray "bounces" off the work-piece and into the breathing zone of the employee. This results in significantly higher concentrations of solvents and resin in the employee's breathing zone then what is found in the remaining spray booth's air space.

RESPIRATORY PROTECTION

In order to protect the employee(s) inside the spray booth against inhalation of overspray and evaporated solvents, employers provide respiratory protection to their employees in accordance with Sections 5153(g) and 5144. A commonly used respirator in spray coating operations is the air purifying respirator to remove the toxic components from the workers breathing air inside the spray booth. However, any overspray and solvents not filtered out by the respirator filters, or that leaks into the respirator when the face piece's seal is lost, are inhaled by the worker and represents a significant health hazard. In addition to the air purifying respirators, supplied air respirators are used in the spray coating industry. The supplied air respirator provides the worker with respirable air from a source outside the spray booths. Because the supplied air respirators are designed to operate with the facepiece under positive pressure, the overspray and solvents inside the spray booth are prevented from contaminating the worker's breathing air, even when the facepiece seal is temporarily lost. For this reason, some spray coating manufacturers require painters to wear supplied-air respirators when spraying paints with toxic components like isocyanate.

RECIRCULATION OF EXHAUST AIR

The spray coating industry has been under pressure to reduce the discharge of volatile organic compound (VOC) emissions to the atmosphere. Where feasible, many spray coating operations have been able to convert their operations to lower VOC containing paints and coatings such as powder coating, waterborne coating, and radiation cured coatings. However, because of the functional requirements for some spray coating applications, acceptable paints with low VOC content may not be available. Consequently, these spray coating operations may require the continued use of the higher VOC content paint formulations.

Studies[1,2,3,4] conducted by United States Environmental Protection Agency and Department of Defense services have demonstrated that the use of spray booth recirculation is a viable means of reducing emissions. The study reports indicate that reductions of exhaust flow rates of up to 90 percent were possible when using recirculation in properly designed and operated booths, while maintaining effective worker protection. The same studies[3,4] have shown that the recirculation of exhaust air causes a significant increase in the concentration of contaminants (solvents and resins) in the background air in the spray booth but shows negligible effect on the already high concentration of contaminants in the breathing zone of the employees operating a spray gun. Board staff feels therefore, that, for spray coating operations that recirculate exhaust air, any upgrading of the personal protective equipment (PPE), would provide equal or superior safety to current Title 8 requirements for spray coating operations that prohibit recirculation of exhaust air.

---

[1] Mobile Zone Spray Booth Recirculation System, K. James Hay, Joyce Baird, Clyde Smith, Don Schiller, United States Army Corps of Engineers, Engineer Research and Development Center, March 2005

[2] Evaluation of Paint Spray Booth Utilizing Air Recirculation (at Deere & Company, Davenport, Iowa), L. E. Norton, R. J. Bryan, D. P. Becvar, United States Environmental Protection Agency, September 1984

[3] Recirculating Ventilation System in an Integrated Maintenance Hangar Supporting B-1B & KC-135 Aircraft, J. D. Wander, B. S. Adams, S. T. Gibbs, C. A. Williston, United States Air Force Research Laboratory, 2000-2001

[4] Cost-Effective Ventilation of a Large-Aircraft Painting Facility at Robins AFB, Georgia, J. D. Wander, W. H. Deaver, J.K. Thovson, T. Hurley, G Doddington, United States Air Force Research Laboratory, April 2005

NATIONAL CONSENSUS STANDARDS

During the review of NFPA 33-2011, Chapter 7.5, Board staff discussed with Nancy A. Pearce CIH, Sr. Fire Protection Engineer with the National Fire Protection Association (NFPA) the scope and intent of Chapter 7.5. Ms. Pearce indicated that the intent of Chapter 7.5 is to control fire hazards during the spray applications using flammable or combustible materials. Ms. Pearce stated that Section 7.5.1 addresses specific fire safety requirements for unstaffed spray coating operations, and Section 7.5.2 clarifies that, in addition to requirements in Section 7.5.1, when recirculating exhaust air during staffed spray coating operations, other safety requirements are mandated that address toxicity and permissible exposure limits that are not addressed by the NFPA 33 standard. Ms. Pearce noted that the intent of Section 7.5.2 was to clarify that there are more restrictive health and safety standards than the fire safety requirements in Section 7.5.1 that need to be addressed. ANSI/AIHA Z9.7-2007, for the Recirculation of Air from Industrial Process Exhaust Systems, is referenced in this context in Section 7.5.2.

In reviewing Section 4.2.1 in ANSI/AIHA Z9.7-2007, Board staff notes that this standard would address the employee health/toxic exposure issue raised by the Division. This standard mandates that if there are components of spray coating materials for which there are no cleaning systems that effectively remove the hazardous contaminants, the recirculation of such exhaust air would be prohibited.

FEDERAL OSHA STANDARD

Board staff notes that although the current federal OSHA spray finishing standards in 29 CFR 1910.107(d)(9) prohibits the re-circulating of air exhausted from spray operations, an OSHA's letter of interpretation on recirculation of exhaust air dated September 17, 2001 from Richard Fairfax to Robert Trinkl provides the spray coating industry with greater latitude and permits the recirculation at both unstaffed and staffed spray coating operations provided employers comply with NFPA 33-2000, Chapter 5, Sections 5.5.1-5.5.2 (superseded by NFPA 33-2011, Chapter 7, Sections 7.5.1 - 7.5.2).

The scenario detailed in the September 17, 2001 letter of interpretation involved a company considering the installation of recirculated air systems in spray booths in a new plant. The systems would be designed to comply with NFPA 33-1995 requirements and would use approximately 80% recirculated air and 20% fresh air. Employees would wear appropriate protective clothing including positive-pressure air-supplied hoods.

Federal OSHA was asked by Robert Trinkl, Corporate Safety Manager, Harley-Davidson Motor Company, whether the use of recirculated air as described above would be considered a de minimis violation of 29 CFR 1910.107(d)(9). Mr. Richard Fairfax, Director of OSHA's Compliance Programs, replied that, under the current OSHA policy on de minimis violations, employers are allowed to comply with the most current consensus standards applicable to their operations, rather than with the OSHA standard in effect at the time of inspection, when the employer's action provides equal or greater employee protection."

Although, Mr. Fairfax fails to directly address the scenario, it appears, pursuant to the policy for de minimis violations also described in the letter of interpretation, that employers could choose to comply with NFPA 33-2007, Section 7.5, (including subsections 7.5.1 through 7.5.2), as long as they provide equal or greater employee protection to that required under 29 CFR 1910.107(d)(9).

Board staff recognizes the importance of hazard control at spray coating operations to prevent the adverse health effects related to exposures to the hazardous fractions of spray coatings. Board staff notes that both short term and chronic occupational exposures to many of the spray coating components can result in acute life threatening events and chronic health problems that can affect the quality of life of the exposed employees and in some cases their unborn children. Therefore, Board staff has serious reservations with regard to the practice of recirculation of air in staffed spray coating operations because breaches in the safety protocol or engineering controls can have dire consequences for those individuals exposed to the hazardous components of spray coatings as well as increased fire and explosion hazards.

Notwithstanding the above concerns, technical advances at times make changes to safety standards both reasonable and necessary. In the case of this petition, the industry uses both unstaffed and staffed spray coating operations and has developed protocols to address the health and safety of their employees. Therefore, Board staff supports considering a standard that would permit recirculation of exhaust air at unstaffed and staffed spray coating operations when the following conditions are met;

1) The proposal conforms to current national consensus standards,
2) The proposal mandates effective control of hazards to ensure the safety and health of affected employees equivalent or superior to requirements under 29 CFR 1910.107(d)(9).

Board staff feels that there may well be effective means available to employers that will ensure worker protection from exposure to hazardous chemicals during spray coating operations where exhaust air is recirculated. For example, the use of supplied air respirators would provide far superior protection over the commonly used air purifying respirator. Additionally, positive pressure suits worn by workers inside the spray booth can effectively safeguard against exposure to hazardous components of spray coatings.

Board staff feels that an advisory committee, with representation from both labor and management and with the assistance of subject-matter experts in the field of spray coating operations, would be an appropriate means to determine whether there is a necessity for changes to the current standard as proposed by the Petitioner. Board staff therefore supports the continuation of the Board staff's 2003 advisory committee efforts to consider the practice of recirculation of exhaust air in spray coating operations and appropriate requirements and controls to ensure worker health and safety.

SUMMARY AND RECOMMENDATION

Based on the foregoing discussion, Board staff recommends that the Petition be granted to the extent that an advisory committee be convened by Board staff and continue 2003 Board staff efforts to review the practice of recirculation of exhaust air in spray coating operations, consider the recommendation by the Petitioner and, if appropriate, develop a rulemaking proposal for presentation to the Board at a future public hearing. The Petitioner should be invited to participate in the advisory committee deliberations.